

The opinion in support of the decision being entered today is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* ULRICH ZIMMERMANN and MARCUS BEHRINGER

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Appeal 2007-2402  
Application 09/762,850  
Technology Center 1600

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Decided: July 12, 2007

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Before DONALD E. ADAMS, ERIC GRIMES, and  
RICHARD M. LEBOVITZ, *Administrative Patent Judges*.

ADAMS, *Administrative Patent Judge*.

DECISION ON APPEAL

This appeal under 35 U.S.C. § 134 involves claims 29-42, 52 and 56, the only claims pending in this application. We have jurisdiction under 35 U.S.C. § 6(b).

## INTRODUCTION

The claims are directed to a process of purifying alginate (claims 29-42 and 56) and an alginate composition produced by the claimed method of purification (claim 52). Claims 29 and 52 are illustrative:

29. A process for obtaining a highly-purified alginate composition, the process comprising the steps of:

- a) treating raw algae material with a complex forming agent creating a liquid comprising dissolved alginate and solid matter;
- b) filtering said liquid to produce a filtrate, said filtrate being a solution comprising dissolved alginate;
- c) precipitating said alginate out of said solution,
- d) collecting and dewatering the precipitated alginate; and
- e) repeating the steps a) to d) at least once.

52. An alginate composition, manufactured by the process according to Claim 29, comprising a mixed polymer of mannuronic acid and guluronic acid, in which the ratio of mannuronic acid to guluronic acid in the mixed polymer is in the range from about 0.1 to about 9, and the mean molecular weight of the mixed polymer is greater than about 250 kD.

The Examiner relies on the following prior art references to show unpatentability:

Nevins	US 4,954,447	Sep. 04, 1990
Yeh	US 5,489,674	Feb. 06, 1996

Klock et al., "Production of Purified Alginates Suitable For Use in Immunoisolated Transplantation," *Appl. Microbiol. Biotechnol.*, Vol. 40, pp. 638-643 (1994)

The rejections as presented by the Examiner are as follows:

1. Claims 30-32 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite in the recitation of the terms “the extraction” and “the extracting.”
2. Claim 30 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite in the recitation of the term “a complex forming agent.”
3. Claim 31 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite in the recitation of the term “soda solution.”
4. Claim 34 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite in the recitation of the phrase “on the basis of.”
5. Claim 34 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite in the recitation of the phrase “recycling materials from regenerated raw materials.”
6. Claim 35 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite in the recitation of the term “deep filters.”
7. Claims 29-42, 52 and 56 stand rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Klock, Nevins and Yeh.

We affirm.

## DISCUSSION

Indefiniteness:

Claims 30-32 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite in the recitation of the terms “the extraction” and “the extracting.” Claims 30 and 31 depend from claim 29. Claim 32 depends from claim 30. Claim 29 does not recite the term “extraction” or

“extracting” Accordingly, the Examiner finds that claims 30-32 lack antecedent basis for the terms “the extraction” and “the extracting” (Answer 3). Appellants assert that they intend to “amend dependent [c]laims 30-32 to provide proper antecedent basis for all terms. . .” (Br. 11-12). Accordingly, we summarily affirm this rejection.

Claim 30 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite in the recitation of the term “a complex forming agent.” According to the Examiner the “a” in claim 30 “should be changed to - - - the - - - to be clear that the complexing agent is that of claim 29” (Answer 4). Appellants assert that they intend to “amend dependent [c]laims 30-32 to provide proper antecedent basis for all terms, including complex forming agent” (Br. 11-12). Accordingly, we summarily affirm this rejection.

Claim 31 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite in the recitation of the term “soda solution.” According to the Examiner the term “is not defined in the Specification, and it has not been established that it has a precise and definite art recognized meaning” (Answer 4). In response, Appellants assert that “one of ordinary skill in the art [would understand that the term “soda solution”] mean[s] a solution containing sodium, added, for example, in the form of  $\text{Na}_2\text{CO}_3$  . . .” (Br. 12). Appellants direct attention to page 7, line 24 and page 13, lines 17 and 25 of their Specification to support this assertion.

We recognize that Appellants’ Specification discloses that “the source material is initially extracted in the presence of complex forming agents, if appropriate in a soda solution (see below, Example 1)” (Specification 7: 22-24). Appellants’ Specification also discloses the use of  $\text{Na}_2\text{CO}_3$  (Specification 13:17-25). However, we agree with the Examiner that

Appellants' Specification does not define the term "soda solution." Instead, Appellants have simply recited an exemplary component of a "soda solution" -  $\text{Na}_2\text{CO}_3$ . In this regard, the Examiner finds that "there is inadequate support in the [S]pecification that 'soda solution' is to encompass any sodium-containing solution such as a sodium hydroxide solution or a sodium chloride solution that is quite different from a  $\text{Na}_2\text{CO}_3$  solution" (Answer 9). We agree. Accordingly, we affirm this rejection.

Claim 34 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite in the recitation of the phrase "on the basis of." Claim 34 ultimately depends from and further limits claim 29 to require, *inter alia*, that "sedimentation takes place with a porous granulate on the basis of diatomaceous earth, cellulose, or recycling materials from regenerated raw materials." The Examiner finds that the phrase "on the basis of" fails to clearly recite the relationship between the porous granulate and other materials (Answer 4). In response, Appellants assert that "the phrase 'on the basis of' in line 2 of claim 34, while perhaps not the ideal translation from the German original, will be understood in its context by one of ordinary skill in the art" (Br. 12). We disagree. Instead, we find that the Examiner has the better argument. Accordingly, we agree with the Examiner's reasoning that the phrase renders the claim indefinite. Therefore, we affirm this rejection.

Claim 34 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite in the recitation of the phrase "recycling materials from regenerated raw materials." The Examiner finds that the "meaning of this limitation is not described in the Specification, and material within and not

within the scope of the limitation is uncertain" (Answer 4). Appellants do not address this rejection. Accordingly, we summarily affirm this rejection.

Claim 35 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite in the recitation of the term "deep filters." The Examiner finds that Appellants' Specification fails to define the term "deep filters" and it is unclear what structure is encompassed by "deep and not deep" (Answer 4). In response, Appellants assert that "the phrase 'deep filters' in [c]laim 35, while perhaps not the ideal translation from the German original, will be understood in context from the [S]pecification by one of ordinary skill in the art as referring to ultra filtration, or the use of filters having very small pore sizes (spec., p. 14, ll. 6-9)" (Br. 12). The cited portion of the Specification states that "[t]he filtration takes place in multiple stages, whereby initially a deep filter with a pore size of 15  $\mu\text{m}$  and then a filter with a pore size of 0.1  $\mu\text{m}$  is used" (Specification 14:6-9). It remains unclear, however, whether the term "deep filter" relates to a particular pore size, e.g., 15  $\mu\text{m}$ , or relates to the some other structure of the filter itself. As the Examiner explains, "[t]he term 'deep' could relate to filter structure other than pore size, and it would be uncertain to the skilled artisan as to the structure that is 'deep'" (Answer 10). On reflection, we find that the Examiner has the better argument. Accordingly, we affirm this rejection.

Obviousness:

Claims 29-42, 52 and 56 stand rejected under 35 U.S.C § 103(a) as unpatentable over the combination of Klock, Nevins and Yeh. Appellants separately argue claims 29 and 52. Accordingly, we limit our discussion to

claims 29 and 52. Claims 30-42 and 56 will stand or fall together with claim 29. 37 C.F.R. § 41.37(c)(1)(vii).

Claim 29:

Claim 29 is drawn to a process for purifying an alginate composition. The process comprises five steps. First raw algae material is treated with a complex forming agent to create a liquid comprising dissolved alginate and solid matter. The Examiner finds that Appellants' Specification fails to define the term "raw algae material" (Answer 8). According to Appellants' Specification the raw algae material, or source material, can be commercial alginate (Specification 12). As the Examiner explains, "[c]ommercial sodium alginate is a substantially purified form of algae material as compared to algae material as it exists in an algae plant . . . since [the production of] commercial sodium alginate involves isolating algae from the plant and treating it to form sodium alginate" (Answer 7). From this the Examiner reasons that "[i]f commercial sodium alginate, which is a processed algae material, can be considered a raw algae material because it is not a final purified product," then a raw algae material according to claim 29 is an algae material, e.g., alginate, that has not been processed into a final purified product (Answer 7-8). We find no error in the Examiner's reasoning.

In addition, we find that the complex forming agent of claim 29 can be ethylene diamine tetra acetic acid (EDTA). *Cf.* claim 30, which is drawn to "a process according to [c]laim 29, wherein ethylene diamine tetra acetic acid is used as a complex forming agent. . . ."

Accordingly, we interpret the first step of Appellants' claimed process to read on the treatment of an algae material that has not been fully processed with EDTA.

The second step of Appellants' claimed process requires that the liquid be filtered to produce a filtrate solution that comprises dissolved alginate.

The third step of Appellants' claimed process requires the alginate to be precipitated out of the solution.

The fourth step of Appellants' claimed process requires the precipitated alginate to be collected and dewatered, e.g. dried.

The last step of Appellants' claimed process requires that the first four steps be repeated at least once.

The Examiner finds that Klöck teaches a process for purifying an alginate composition that comprises the first four steps of Appellants' claimed process (Answer 5-6). As Appellants recognize, “[b]oth the process recited in claim 29 of the instant application and the process disclosed by Klöck start with a raw alginate material, which may be a commercial alginate material” (Br. 17). Appellants also recognize that Klöck complexes the alginate with barium to form beads (*id.*). While Appellants assert that Klöck's process is radically different from their claimed process (*id.*), as the Examiner explains, Appellants' claimed process does not exclude this first step of Klöck's process (Answer 10). Accordingly, we are not persuaded by Appellants' assertion that “claim 29 does not require the formation of solid barium alginate beads to obtain a purified alginate” (Br. 17).

There can be no doubt that Klöck's alginate purification process begins with the removal of contaminants by treating “ $\text{Ba}^{2+}$ -alginate beads

with solutions using different agents followed by ethanol extraction" (Klöck 639-640: bridging sentence). However, Klöck then dissolves the Ba<sup>2+</sup>-alginate beads in strongly alkaline, EDTA-containing solutions (Klöck 640: col. 1, ll. 1-3). As Klöck explains, "chelating agents can dissolve the Ba<sup>2+</sup>-cross-linked alginates very easily and gently in strongly alkaline solutions" (Klöck 640: col. 2, last full paragraph). Klöck then filters and dialyses the resulting alginate solution "in order to remove the Ba<sup>2+</sup> ions and the reagents" (Klöck 640: col. 1, ll. 3-5 and 47-49). The alginate is then precipitated by the addition of ethanol, and dried (Klöck 640: col. 1, ll. 5-6 and 52-53).

Despite Appellants' arguments to the contrary, Klöck teaches a process for purifying alginate that comprises the first four steps of the process set forth in Appellants' claim 29. We are not persuaded by Appellants' assertion that "[t]he barium beads of Klöck are not raw algae material with respect to the Klöck process . . . [but instead] are its purified product" (Br. 18). As discussed above, Appellants agree that both the process of claim 29 and Klöck's process begin with the same starting material (Br. 17). Klöck's preparation of barium-alginate beads is simply the first manipulative step in Klöck's process, which is not excluded from Appellant's claimed process. Therefore, we disagree with Appellants' assertion that Klöck's barium beads are the purified product. To the contrary, for the reasons discussed above, we find that the barium-alginate beads are raw algae material within the scope of claim 29. Therefore, we disagree with Appellants' assertion that "[t]he fact that the process of claim 29 dissolves the raw algae material by treatment with a complex forming agent by definition excludes forming barium alginate beads" (Br. 19).

We recognize Appellants' arguments relating to the modification of Klöck's process "to remove the step of forming barium alginate beads. . ." (Br. 20-22). However, for the reasons set forth above, such a modification is unnecessary to reach the requirements of claim 29. Accordingly, we find no error in the Examiner's reliance on Klöck to teach the first four steps of Appellants' claimed process.

The Examiner recognizes that Klöck does not teach the last step of Appellants' claimed process, which requires the first four steps to be repeated at least once (Answer 6). However, as the Examiner explains "repeating purification steps of a process to obtain greater purity" is known in the art as evidenced by both Nevins and Yeh (*id.*). For their part, Appellants do not dispute the teachings of Nevins and Yeh, but instead assert that according to the Examiner's rationale, each repetition would start with naturally occurring algae containing multivalent cations to create a "commercial alginate", then barium ions would be added, and etc. (Br. 24).

According to Appellants, there is "no evidence that one of ordinary skill in the art would reasonably expect this would yield an alginate of superior purity" (*id.*). We are not persuaded by this argument. First, there is no requirement in claim 29 that the final alginate produced by the claimed process be of a "superior purity." The invention of claim 29 is simply drawn to a process for obtaining a highly-purified alginate composition. Absent evidence to the contrary, of which there is none, since the combination of Klöck, Nevins and Yeh teaches a process comprising the same method steps as set forth in Appellants' claim 29, one would expect the final product to be the same.

Further, we note that Appellants appear to be asserting that a purified alginate composition could not be obtained according to the combination of prior art relied upon by the Examiner because a “new” batch of raw algae material would be introduced into the process upon each repetition of the process. While we have interpreted the last step of Appellants’ claim to read on repeating the first four process steps with the material obtained at the end of step four, we note that Appellants’ claimed process does not exclude introducing new “raw algae material” into the process upon each repetition. Accordingly, it is unclear how Appellants intend to distinguish the process of claim 29 from their argument against the Examiner’s *prima facie* case.

Nevertheless, we note that “[a] person of ordinary skill is also a person of ordinary creativity, not an automaton.” *KSR Int’l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1742, 82 USPQ2d 1385, 1397 (2007). Accordingly, we find that a person of ordinary skill in the art would recognize that it is the material obtained at the end of each process step, not new unprocessed material, which is reintroduced into a repeat of the processing steps to obtain higher levels of purity. In this regard, we presume that a person having ordinary skill would exercise common sense and sound judgment. *In re Sovish*, 769 F.2d 738, 226 USPQ 771 (Fed. Cir. 1985).

On reflection, we find no error in the Examiner’s *prima facie* case of obviousness. Here, the references cited by the Examiner disclose all the elements of the claimed process. For the reasons set forth above, we are not persuaded by Appellants’ arguments to the contrary. Accordingly, we affirm the rejection of claim 29 under 35 U.S.C § 103(a) as unpatentable over the combination of Klock, Nevins and Yeh. Claims 30-42 and 56 fall together with claim 29.

Claim 52:

Claim 52 is drawn to an alginate composition produced by the process set forth in claim 29. According to claim 52 such an alginate composition will have a ratio of mannuronic acid to guluronic acid in the mixed polymer in the range from about 0.1 to about 9, and a mean molecular weight of mixed polymer that is greater than about 250 kD.

The Examiner relies on Klöck, Nevins, and Yeh as discussed above. In response, Appellants assert that “[c]laim 52 recites a composition made with the process, which differs significantly from that of the references in purity and biocompatibility and is not rendered obvious by the references separately or in combination” (Br. 20). For the reasons set forth above, we disagree.

Absent evidence to the contrary, of which there is none, if the prior art teaches the use of the same starting material as recited in the claim and performs the same manipulative steps as set forth in the claim, one would expect the final product to be the same.

Accordingly, we affirm the rejection of claim 52 under 35 U.S.C. § 103(a) as unpatentable over the combination of Klock, Nevins and Yeh.

#### CONCLUSION

In summary, we affirm the rejection of claims 30-32, 34, and 35 under 35 U.S.C. § 112, second paragraph and the rejection of claims 29-42, 52 and 56 under 35 U.S.C. § 103(a).

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No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

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